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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

DIAZ, THOMAS C

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/567,882	<b>Applicant(s)</b> HOFFMANN ET AL.	
	<b>Examiner</b> THOMAS DIAZ	<b>Art Unit</b> 3656	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 March 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 7-12, 14-32, 34-37 and 82-87 is/are pending in the application.
- 4a) Of the above claim(s) 38-81 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12, 14-32, 34-37 and 82-87 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06/09/2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Staus of Claims***

This office action is in response to the reply filed on 03/23/2010. The examiner appreciates and acknowledges applicant's response.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-5, 7, 8, 12, 15-27, 29-32, 34, 36, 37, 82-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taubmann et al. (WO9951456A1; using USP 7051986 as a translation of the PCT reference for discussing the rejection) in view of Hendrick (USP 2128483) and further in view of Landskron et al. (USpgpub 20040206195).**

***Examiner notes that the exact location of the discussed reference numerals or column and line numbers may not exactly correspond with the exact location in PCT document.***

*Regarding claim 1*, Taubmann et al. discloses an adjustable mechanism (see title) comprising a spindle nut (fig.4, 92) interacting on one side with a threaded spindle (fig.1, 5) and interacting with a further gearing element (fig.4, 91) and wherein the

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spindle nut has an opening with an internal surface (fig.4, inner opening with the internal surface), said internal surface comprising an internal tothing (fig.4, not explicitly shown but since in the specification element 5 is a threaded spindle, the internal surface of 92 has to be threaded, at the very least, as acknowledged by the applicant it would have to be internally threaded along the middle section of the spindle nut 92'. Even if the internal threads do not extend to the bearing collars.) through which the spindle nut interacts with the threaded spindle.

Taubmann et al. fails to explicitly disclose the external tothing of the spindle nut is formed through radially inwardly pointing indentations in the external surface of the spindle nut such that a crest of each tooth is defined by a portion of the external surface of the spindle nut and wherein tooth depth diminishes towards at least one axial end of the spindle nut and at least one side of the external tothing having an end section without external tothing, and wherein an outer diameter of the crest is less than or equal to an outer diameter of the end section and wherein the external tothing comprises, in the axial direction, two axial edge regions and a center region having different tothing shapes, wherein the external tothing is globoid in shape in said axial edge regions with a tooth depth continuously reducing towards the axial ends of the external tothing, and wherein the center region has a cylindrical portion with an involute profile in the axial direction.

Hendrick teaches a spindle nut or worm wheel (fig.5 and fig. 6, element 47 and 51) wherein the external tothing of the spindle nut is formed through radially inwardly pointing indentations in the external surface of the spindle nut such that a crest of each

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tooth (see fig.5) is defined by a portion of the external surface of the spindle nut and wherein tooth depth diminishes towards at least one axial end of the spindle nut (see fig.5) with at least one side of the external toothing having an end section without external toothing (both sides have end sections without external toothing), and wherein an outer diameter of the crest is less than or equal to an outer diameter of the end section (as seen in figs. 5 and 6, the outer diameter of the crest is less than or equal to the outer diameter of the end sections); wherein the external toothing comprises, in the axial direction, two axial edge regions and a center region having different toothing shapes (see fig.5), wherein the external toothing is globoid in shape (the axial edge regions of this toothing is globoid in shape) in said axial edge regions with a tooth depth continuously reducing towards the axial ends of the external toothing, and for the purpose of providing gear teeth with longer bearing surfaces and decreasing backlash between the worm and the spindle nut (page 2, col.1, lines 53-61).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the spindle nut (in particular the nut portion 92', not including the collars) disclosed by Taubmann et al. to include the gear teeth taught by Hendrick in order to provide a spindle nut with longer bearing surfaces and decreasing backlash between the worm and the spindle nut (page 2, col.1, lines 53-61). This would improve the meshing engagement between the nut and the worm and improve the accuracy and durability of the seat adjusting mechanism.

As a result of the combination made above, Taubmann et al. discloses the internal toothing of the spindle nut interacting with the threaded spindle would extend

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over a greater length in the axial direction than the external toothing of the spindle nut so that the internal toothing extends axially into the at least one end section without external toothing (since the internal toothing disclosed by Taubmann et al. extends at least through the middle section 92', in other words not including the collars, then as a result modifying the external surface of 92', the internal teeth would have to extend at least into the end sections without external toothing which would be part of the external surface 92'.)

Taubmann et al. in view of Hendrick fails to explicitly disclose wherein the center region [of the toothing] has a cylindrical portion with an involute profile in the axial direction.

Landskron et al. teaches a particular tooth profile in fig.3 for a worm wheel which has a center region [of the toothing] which has a cylindrical portion with an involute profile in the axial direction (as seen in fig.3, 60 is cylindrical and depressed relative to the first tooth crowns). The particular tooth profile is used for predictable purpose of reducing noise and backlash between the worm and worm wheel and for allowing for teeth of the drive worm to engage with the worm wheel which provides a stronger meshing engagement.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the gear teeth disclosed by Taubmann in view of Hendrick by including the specific toothing profile as taught by Landskron et al., for predictable purpose of reducing noise and backlash between the

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worm and worm wheel and for allowing for teeth of the drive worm to engage with the worm wheel which provides a stronger meshing engagement.

*Regarding claim 2-5, 7, 8,* Hendrick discloses the external toothing diminishing to zero at both ends of the spindle and the diameter of the end section being larger than or equal to the diameter of the external surfaces provided with indentations.

*Regarding claim 9,* Hendrick discloses the external toothing is globoid in shape and more particularly has globoid toothing in its axial edge regions (see fig.5, the toothing is globoid since it is rounded towards the edge regions)

*Regarding claim 10,* Taubmann in view of Hendrick and further in view of Landskron discloses the external toothing has an involute profile in a middle section in the axial direction (see fig.5; the toothing has a circular involute profile in the axial direction represented by the dotted lines).

*Regarding claim 11,* Landskron teaches the spindle nut being made of plastic (paragraph 36).

*Regarding 12,* Taubmann et al. discloses the further gearing element is a worm gear (fig.4, 91; see disclosure) and the external teeth of the spindle nut interacts with the worm gear.

*Regarding claim 15,* Taubmann et al. discloses that the spindle nut and further gearing element (worm) are mounted in a gearbox housing (fig.5, 7).

*Regarding claim 16,* Taubmann et al. discloses that the gearbox housing is made of housing parts (seen in figure 4 which shows an exploded view of all the components).

*Regarding claim 17*, Taubmann et al. discloses that the housing parts are connected to one another through push-fit connections and are aligned relative to each other along all special directions (seen in figure 5, elements 76 are push fit into recesses provided on 71a and 71b and all the housing parts are aligned).

*Regarding claim 18*, Taubmann et al. discloses the gearbox housing comprising one or two pairs of opposing housing parts (fig. 5, 71a and b and 72a and b are two pairs of housing parts).

*Regarding claim 19*, Taubmann et al. discloses the gearbox housing comprises housing parts which have a U-shaped cross-section (fig.6, 71; a cross-section taken down the centerline of a vertical axis would yield a U-shape cross-section). It is noted that changing the shape of this housing would be well within the skill in the art.

*Regarding claim 20*, Taubmann et al. discloses the external parts (fig.6, 71) engaging round bearing parts (fig.7, 72) mounted opposite one another to support the spindle nut (fig.5).

*Regarding claim 21*, Taubmann et al. discloses the external housing parts surrounding bearing sections (fig.7, 74 or fig.5, 74a and b).

*Regarding claim 22*, Taubmann et al. discloses that the gearbox housing is comprised of plastics (col.4, lines 64-66; housing parts can be made of plastics).

*Regarding claim 23*, Taubmann et al. discloses bearing points or bearing openings for the spindle nut and further gearing element or worm (fig. 5, generally indicated by 74a and b and 73a and b).



*Regarding claim 24*, Taubmann et al. discloses a bearing collar which protrudes from the axial end sections of the spindle nut (fig.4, see 92 which clearly has bearing collars or shoulders as called by the applicant).

*Regarding claim 25*, Taubmann et al. discloses the end sections further define bearings (fig.4, 92) for supporting the spindle nut whereby the axial and radial bearing is produced through a pair of housing parts of a gearbox housing (see fig.5, the bearing is formed when assembled with housing parts).

*Regarding claim 26, 29, and 30*, Taubmann et al. discloses the gearbox housing has recesses (fig. 5, generally indicated by 74a and b and 73a and b) in the boundary walls for the spindle nut and further gearing element to engage.

*Regarding claim 27*, Taubmann et al. discloses that the recesses are formed through openings in the boundary walls (see same fig.5, 74a and b, 73a and b). The examiner notes that the process of forming these recesses is not given patentable weight.

*Regarding claim 31*, Taubmann et al. discloses that between the gearbox housing and an associated holder (fig.4, 8) of the gearbox housing there is at least one element (fig.4, 10a and b) for acoustic uncoupling (col.3, lines 44-47). It is noted that bearing plates (fig.5 72a and b) could also act as uncoupling elements.

*Regarding claim 32*, Taubmann et al. discloses that the elements (fig.4, 10a and b) are made of one of rubber and plastic (these members are capable of being injected moulded) It is noted that this claim is a product by process in which the element is made by injection moulded and the process is not given patentable weight.

*Regarding claim 34*, Taubmann et al. discloses that the housing parts can be connected to each other through laser welding (col.2, lines 23-26; or col.6, lines 10-13).

*Regarding claim 36*, as discussed above Taubmann et al. discloses these bearing plates and gearbox housing. This is a product by process claim and the process of making these components is immaterial to the patentability of the product.

*Regarding claim 37*, Taubmann et al. discloses a gearbox housing (discussed above) set in a holder of U-shaped cross-section (fig.2, 8) which can be fixed to an associated adjustable part (such as the seat or top rail 3 not shown in figures).

*Regarding claim 82*, Taubmann et al. discloses the spindle nut has in the axial direction on either side of the external toothing an end section without external toothing, and wherein the end sections (fig.4, 92) serve at the same time as bearings for supporting the spindle nut whereby the axial and radial beating is produced through a pair of housing parts of a gearbox housing.

*Regarding claim 83*, Taubmann et al. discloses the housing parts as housing plates (they name the housing parts, housing plates).

*Regarding claim 84*, Taubmann et al. discloses that the bearing points as described above are in the form of bearing opens (see the same elements as above).

*Regarding claim 85*, Taubmann et al. discloses that the at least one element (fig.4, 10a or b) of claim 31 is in the form of a resilient member since it is made of rubber and plastic and designed to eliminate noise and compensate for tolerances.

*Regarding claim 86*, Taubmann et al. discloses the elastic elements as discussed above which can be made of plastic. As shown in the figure these elements are one

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piece and would be attached on the gear housing. This is a product by process claim so the process of making the element by injection moulding is not given patentable weight.

*Regarding claim 87*, Taubmann et al. discloses that the reinforcement ring (fig.4, 96) is mounted on the bearing collar as seen in figure 4.

**Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taubmann et al. (WO9951456A1; using USP 7051986 as a translation of the PCT reference for discussing the rejection) in view of Hendrick (USP 2128483) and further in view of Landskron et al. (USpgpub 20040206195), as applied to claim 1 above, and further in view of Hauser, Jr. (USP 4386893).**

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*Regarding claim 14*, the combination of Taubmann et al. and Hendrick and Landskron is silent to the tooth thickness of the internal toothing of the spindle nut interacting with the threaded spindle being greater than the gap between each tooth.

Hauser, Jr. teaches using a tooth thickness that is greater than the gap between the meshing teeth (see fig.1) for the purpose of increasing bearing surface and thus increasing lubrication of a fluid film (see claim 1).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to change the shape of the internal toothing taught by Taubmann et al. to be thicker than the gap between the internal toothing and the threaded spindle in order to provide the predictable results of increasing the bearing surface. Furthermore, if a lubricant were added to the interface, the bearing would have more lubricating surface.

**Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taubmann et al. (WO9951456A1; using USP 7051986 as a translation of the PCT reference for discussing the rejection) in view of Hendrick (USP 2128483) and further in view of Landskron et al. (USpgpub 20040206195), as applied to claim 26 above, and further in view of Segal (USP 2313776).**

*Regarding claim 28*, the combination of Taubmann et al. and Hendrick and Landskron above are silent to the recess being in form of an indentation.

Segal teaches a recess being in the form of an indentation in a boundary wall of a toilet paper holder for the predictable purpose of holding the spindle (fig.3, S).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the recess taught by Taubmann et al. to be in the form of an indentation instead of an opening in order to provide the same predictable result of supporting the spindle nut or other gearing element.

**Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taubmann et al. (WO9951456A1; using USP 7051986 as a translation of the PCT reference for discussing the rejection) in view of Hendrick (USP 2128483) and further in view of Landskron et al. (USpgpub 20040206195), as applied to claim 34 above, and further in view of Muellich (USP 5893959).**

*Regarding claim 35*, Taubmann et al. does disclose the use of laser welding to connect the parts of the housing and laser technology, as discussed above.

However, Taubmann et al. is silent to the external housing parts (fig.4, 71a and b) being transparent and the internal housing parts (fig.4, 72a and b) being non-transparent.

Muellich teaches the use of a transparent housing cover (fig.1, 8) and a non-transparent housing base (fig.1, 7) for allowing a laser beam to shine through the housing cover and create a weld with an inner surface of the housing base.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the housing parts taught by Taubmann et al. by making the external housing parts transparent and the internal housing parts non-transparent as taught by Muellich for the purpose of allowing the laser beam during

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laser welding to shine through the housing part and create a weld on the inner contact surfaces between the parts. Examiner notes that this would create a better weld than just welding the outside of these components.

### ***Response to Arguments***

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS DIAZ whose telephone number is (571)270-5461. The examiner can normally be reached on Monday-Friday 8:30am to 5:00pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571)272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas Diaz/  
Examiner, Art Unit 3656

/Richard WL Ridley/  
Supervisory Patent Examiner, Art Unit 3656